

MARTINS, Raphael Corrêa. *Influence of intense physical training on factors related to the microcirculation in pentathletes*. 2013. p. Dissertation (Master's degree in Food, Nutrition and Health) – Institute of Nutrition, University of the State of Rio de Janeiro, Rio de Janeiro, 2013. *Supervisor*: Josely Correa Koury e Caroline Buss.

Resumo

The microcirculation is the segment of the circulatory system responsible for ensure the offer of nutrients, oxygen and hormones to the tissues. Beyond to removing products from cell metabolism and maintenance of body temperature. Physical activity is able to alter the body composition and the antioxidant capacity and the both being able to influence the parameters of microcirculation. Among the techniques used to evaluate microcirculation, the videocapillaroscopy is a validated method used to determine the morphology and functionality of capillaries in different groups, including athletes. Little is known about the changes of microcirculation parameters due to intense training. The aim of this study was to evaluate the influence of intense physical training on body composition, biochemical markers of muscle damage and antioxidant status and their effects on parameters of microcirculation in pentathletes. Participated in this study young male competitive pentathletes (n=8, mean age $26,8 \pm 4,8$ years) in two moments, the first after resting (Baseline), previous the competition, and the second after 60 days (T1) of intense physical training. The microcirculatory parameters were evaluated by periungueal videocapillaroscopy. The antioxidant extracellular capacity was determined by plasmatic uric acid and biological antioxidant potential concentrations, and the intracellular by erythrocyte superoxide dismutase concentration. As an indicator of lipidic peroxidation was used the plasma malondialdehyde concentration, and for tissue damage plasmatic total creatina kinase and urea. Total and fractions body composition was determined by Dual-energy X-ray absorptiometry. To evaluate the energy homeostasis was measured leptin concentrations. There was reduction in total fat mass (Baseline: 12.3 (7.3 - 14) / T1: 10.1 (7.4 - 14) kg, $p=0.023$), fat arms (Baseline: 1.1 (0.7 - 1.5) / T1: 0.9 (0.7 - 1.6) kg, $p=0.039$) and trunk (Baseline: 5.6 (3 - 6.6) / T1: 4.4 (2.9 - 6.3) kg, $p=0.008$). There was a reduction in leptin concentrations (Baseline: 1.95 (1.06 - 2.45) / T1: 1.29 (0.49 - 1.75) ng/mL, $p= 0.016$) and this was not associated with a reduction in fat mass There was observed increase in concentrations of plasma creatina kinase (Baseline: 94.50 (69.00 - 141.00) / T1: 137.00 (97.00 - 250.00) UI/L $p=0.023$) and urea (Baseline: 31.50 (26.00 - 51.00) / T1: 36.50 (29.00 - 39.00) mg/dL $p=0.031$) indicating tissue damage. The percentage variations of creatine kinase and funcncional capillary density were positively

correlated ($r = 0,714$, $p = 0,037$). The intense physical training wasn't change the antioxidant status, as well as the microcirculation parameters. Among the indicators studied, only the concentration of plasmatic creatine kinase appears to be involved with the reduction of functional capillary density in 5 of 8 athletes.